The 2001 Traffic Monitoring Guide

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The 2001 Traffic Monitoring Guide

- An update of the existing guidance provided by FHWA
- Intended primarily for state highway agencies
- Applicable to all highway agencies

The 2001 Traffic Monitoring Guide

- TMG Covers:
  - Volume
  - Vehicle Classification
  - Vehicle weights

The 2001 Traffic Monitoring Guide

- TMG designed
  - To describe “good practice”
  - To provide flexibility at the state level
  - To improve quality of available data, particularly truck information

Data Collection Framework

- All program elements (volume, class, and weight) require
  - **Continuous count programs**
  - **Geographic coverage**

Data Collection Framework

- A good count program includes:
  - **HPMS sample data collection**
  - **Coverage or obsolescence counts**
  - **Project specific counts**
    - Pavement design
    - Traffic operations
    - Other special needs (including other statistical samples)

Data Collection Framework

- Collect classification count data (in place of simple volume counts) whenever possible

- Rules of thumb:
  - **30 percent of all counts should be classification counts**
  - **At least one classification count per “road”**

Data Collection Framework

- Data sharing and cooperation between agencies is necessary to
  - **Improve the availability of data**
  - **Improve the quality of data**
  - **Reduce the cost of data collection**

Volume Count Program

- Continuous count program
  - **Supplies temporal data needed to understand the differences between short duration and annual conditions**
  - **Should get this data from more than the traditional ATR program**

Volume Count Program

- Continuous Counts – Where Else to Get This Data?
  - **Use of ITS surveillance data, especially in high volume urban locations**
  - **Use of continuous classifiers and WIM devices**
  - **Use of other agency's data collection devices**

Volume Count Program

- Short Duration Counts
  - **Require adjustments**
    - Axle correction (when appropriate)
    - Day of week
    - Season
    - Time of day (for less than 24-hour counts)

Volume Count Program

- Short Duration Count Program Design
  - Determine agency specific statistical sample needs and locations
  - Determine HPMS needs and locations
  - Determine project specific needs and locations
  - Compare and coordinate needs
  - Add in additional coverage/obsolescence requirements
  - Schedule counts for efficient manpower / equipment use

Volume Count Program

- HPMS
  - No change in HPMS counting requirements
  - State highway agencies are responsible for HPMS counts, regardless of whether they actually collect them or not
  - Maintain both HPMS sample and universe count information

Classification Count Program

- More emphasis is being placed on truck counts
  - **Importance of trucks to**
    - Pavement design and maintenance
    - Economic vitality of each state
    - Increasing role in prioritizing road improvements

Classification Count Program

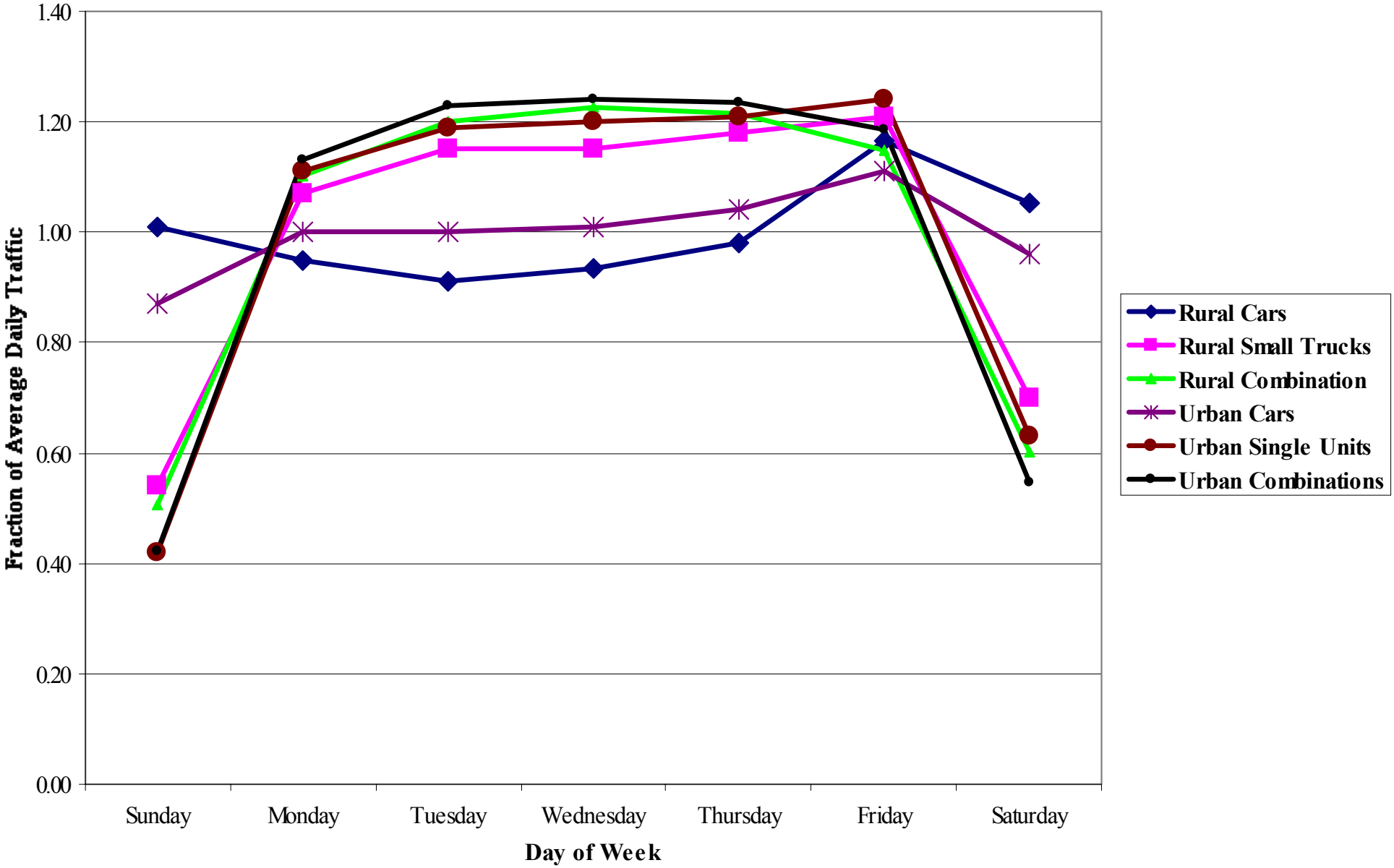
Intent

All highways should have valid, accurate, reliable truck usage information

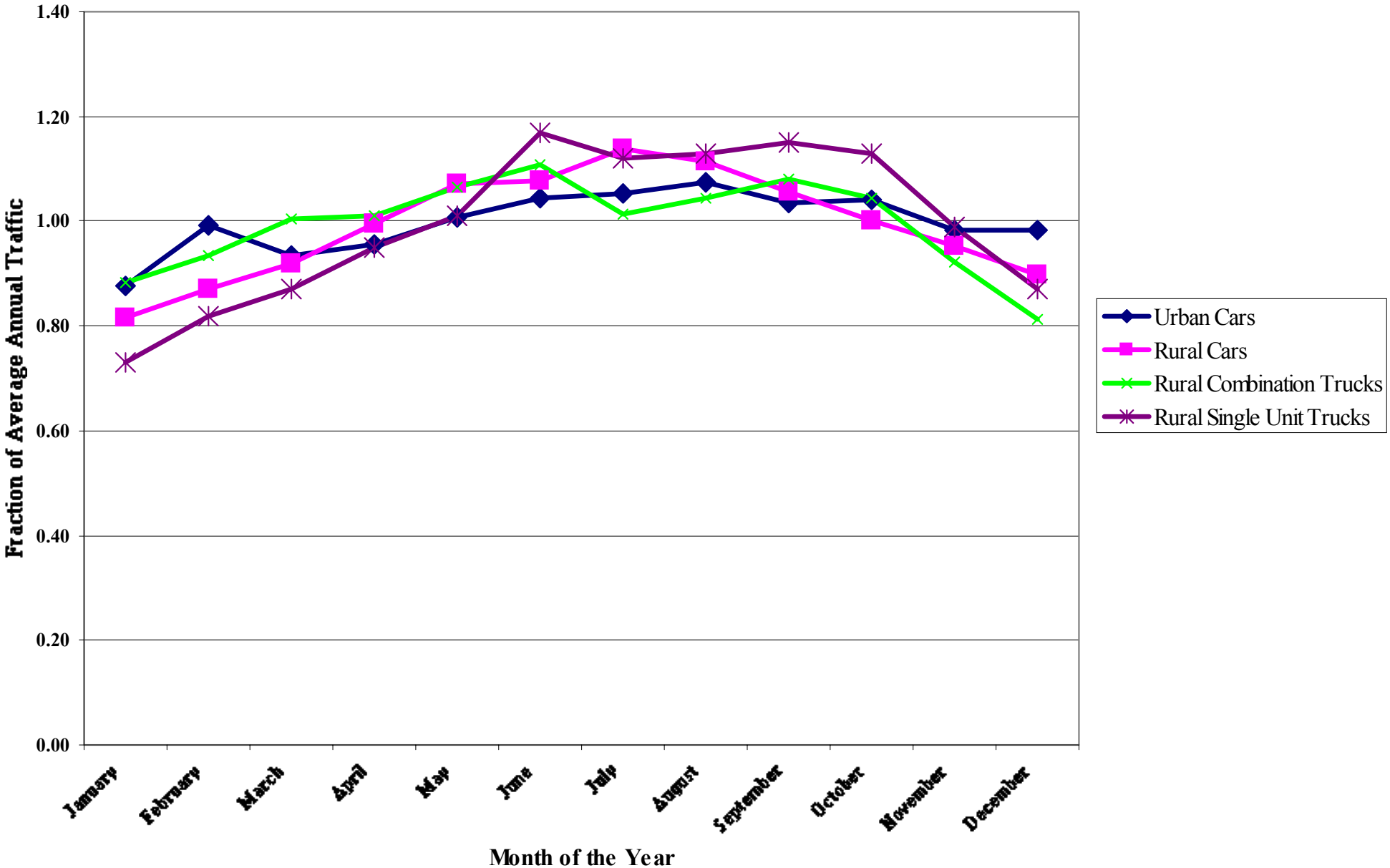
Classification Count Program

- States Need Continuous Classification Counts
  - **Provides measures of**
    - Day of week variation
    - Seasonal variation
    - Time of day variation
- Continuous classification counters can replace traditional ATRs

Common Day of Week Volume Patterns



Common Monthly Volume Patterns By Class



Classification Count Program

- States need to develop a factoring approach that accounts for truck variability, not just volume variability
- TMG recommends developing trucking movement specific factoring process

Classification Count Program

- Continuous classification program should be roughly the size of the ATR program
- One counter can serve both purposes

Classification Count Program

- Truck volume factoring process
  - **Define trucking movements and their variability**
    - Urban versus rural
    - Geographic differences
      - Natural resources
      - Economic (industry versus agricultural)
    - Roadway movements (through versus local)

Example Truck Factor Groups

- Rural Roads
  - Interstates
  - Northern Rural Roads with limited through movements
  - Southern Rural Roads with limited through movements
  - Rural Roads with large through movements
- Urban Roads
  - Urban roads with large through movements
  - Interstates and other freeways serving primarily local traffic
  - Other urban roads

Classification Count Program

- Short Duration Counts
  - **Many agencies need to increase the number of classification counts they take**
  - **Rules of thumb:**

    30 percent of counts taken should be classification counts

    Every road should have one classification count each year

Classification Count Program

- FHWA 13 Category classes are the preferred system
- Not all data must be collected or should be reported using this system
- Subsets of, or alternatives to, this system can be used where appropriate

Classification Count Program

- When are different classification schemes OK?
  - **Where equipment limitations prevent it**

    Loop based permanent classifiers (urban freeways)
  - **Summary reports to users**
  - **Where statistical reliability in factoring is needed**
- Agencies must understand how different classification schemes relate to each other

Classification Count Program

- Highway agencies need to thoroughly test their classification algorithms
  - **Validate basic algorithm**
  - **Test each new batch of equipment**
  - **Understand how different algorithms relate**
  - **Perform calibration and quality control tests**

Classification Count Program

- Understand, report, and teach the difference between:
  - **Average annual weekday truck traffic**
  - **Average annual daily truck traffic**
  - **Daily truck traffic**
  - **Truck percent**
  - **Peak period truck percent**

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Truck Weighing Program

Intent

Each highway should have accurate reliable truck weight information

- **Gross vehicle weights**
- **Axle weight distributions**
- **Truck volumes**

Truck Weighing Program

TMG Recommends:

Creation of “Truck Weight Roadway Groups”

Truck Weighing Program

- Truck weight roadway groups
  - **Each road in the group should experience trucks with similar loading patterns**

    That is, the loading pattern per truck class should be the same

Example Truck Weight Roadway Groups

- Rural Roads
  - Interstates and other roads serving primarily through traffic
  - Northern (agricultural area) roads
  - Southern (resource extraction) roads
- Urban Roads
  - Interstates
  - Interstates and freeways serving primarily local traffic
  - Roads primarily serving ports
  - Roads that serve primarily through traffic
  - Other urban roads

Truck Weighing Program

- State highway agencies can design their own truck weight roadway groups
- Data should be collected to define those groups
- States can work together to collect data cooperatively

Truck Weighing Program

- Truck weight roadway groups should be easily identified and applied by users

- The initial key is to define roads with high loading factors from those with low loading factors
  - **(NOT high volume versus low volume)**

Truck Weighing Program

- Data collection within each group
  - **Should consist of multiple sites (rule of thumb: six sites per group)**
  - **Should include at least one continuous WIM location**

    (Continuous counter can serve as a continuous classifier and as an ATR)

Truck Weighing Program

- State agencies are encouraged to spend more time on collecting good data and less time on collecting data at many locations
  - **Equipment calibration**
  - **Equipment/site maintenance**
  - **Quality control procedures**

Truck Weighing Program

- Care should be taken trading off
  - Number and variety of locations (geographic knowledge)
  - Duration of counts (temporal variation)
  - Quality of data
  - Resources required (staff and money)

Truck Weighing Program

- As equipments / sites fail
  - **Consider moving those sites to new data collection locations**
    - Value of data at new location versus value of trend information
    - Cost of new site versus repair of old site
  - **Work with other agencies to share expenses and data**

2001 Traffic Monitoring Guide – Key Points

- Collect and report quality data
- Work cooperatively
- Market your data!

2001 Traffic Monitoring Guide – Key Points

- Increase the emphasis on counting truck volumes
- Factor truck counts for day-of-week and season
- States can use other classification systems in addition to FHWA's 13-category system

2001 Traffic Monitoring Guide – Key Points

- HPMS Counts should remain the mainstay of statewide traffic counting
- Enough coverage counting should be done to maintain the accuracy of all volume estimates
- Agencies need to obtain, store, and use ITS data to supplement existing programs

2001 Traffic Monitoring Guide – Key Points

- Truck weight program has become less statistically rigorous and more tuned towards the needs of the AASHTO 2002 Pavement Design Guide

- Truck weight program focuses on quality rather than quantity